

Bacteriological Analysis

The State Public Health Laboratory (SPHL) will test for three different types of bacteria. They are coliform, e-coli, and iron bacteria. These methods are found in the latest edition of the American Public Health Association's *Standard Methods for the Examination of Water and Wastewater*, and comply with the U.S. environmental Protection Agency and Missouri Department of Health and Senior Services standards for drinking water.

Coliform bacteria occur naturally in soil, on vegetation, and in surface waters such as lakes or streams. They also can be found in the intestines of humans and other animals. Majority of the coliform bacteria are not harmful and are used as an "indicator bacteria" in drinking water. If present, contamination of the water has occurred, and other disease causing bacteria may also have gotten into the water supply.

Escherichia coli (e-coli) is a member of the coliform group of bacteria and is found only in humans and warm-blooded animals. E-coli in the drinking water indicates that it has been recently contaminated with human or animal wastes.

Iron bacteria occur naturally in the soil and derives its energy by oxidizing iron, manganese or aluminum. This oxidizing process creates a reddish-brown slime which over time can build up clogging screens, well pumps, faucets, pipes, tanks etc... Iron bacteria is not harmful however, it does produce an unpleasant taste and odor.

When testing for these bacteria, the SPHL tests for presence/absence only, not a specific count. Other tests for specific waterborne pathogens (bacteria) may be available by request. Contact your regional EPHS V.

Bacteriological forms

There are two types of forms used to submit bacteriological samples:

1. The "Official" drinking water analysis form (LAB 10G) submitted by LPHA, EPHS with DHSS or an approved water/septic system inspector licensed by the DHSS.
2. The "Unofficial" drinking water analysis form (LAB 10C), used by property owners taking their own water samples and sending them to the SPHL.

How to fill out bacteriological forms

- Sample shall be recorded on an “Official Private Water Form.”
- **Record the month/day/year and time the sample was collected and the bottle number or the sample will not be tested.**
- Record sampler’s name as well as the Health department’s address and phone number.
- Log the owner’s name and address along with township and range.
- Record supply type.
- Identify type of facility
- Mark the type of well construction.
- Identify type of sewage disposal.

* If testing for iron bacteria, it must be indicated on top of the form.

Bacteriological Water Sampling Procedures

- Wash hands thoroughly.
- Use a 100ml sample bottle obtained through the SPHL.
- Take water sample from a smooth-nosed cold water tap if possible. A hot/cold-mixing faucet is not preferred but may be used. Take water sample from the most frequently used faucet in facility.
- Examine faucet to assure its not leaking.
- Ask owner to remove aeration devices/screens.
- Run water fully for 2-3 minutes. If a mixing faucet is used, run hot water for three minutes and cold water for three minutes.
- Chemically disinfect the tap with a 100ppm sodium hypochlorite solution. This can be made by mixing 1.5 teaspoons of bleach with one gallon of water.
- Flush the tap for an additional 2-3 minutes then reduce to gentle flow to fill bottle without splashing.
- Grasp the cap along the top edge and remove. Do not contaminate cap by touching the inside or laying it on a dirty surface.
- When filling the bottle, do not allow water to flow over hand into the bottle.
- Fill the bottle up to the 100ml line.
- Replace cap without touching inside of lid and tighten.

Do not rinse the bottle; there is a chlorine neutralizer present in liquid or crystalline form. The bottle should remain closed until you are ready for its use. Pay special attention not to contaminate the inside of the lid or bottle. If there is less than ½ inch air space in the bottle, the

sample will not be tested. Be sure the number on the bottle matches the number on the form. Any incomplete forms will result in the sample not being tested.

Samples submitted by property owners must be in kits provided by SPHL or State District Health Offices. There is a \$10.00 fee assessed upon completion of the test.

Shipping instructions

Water samples should only be collected on Monday through Wednesday unless it is an emergency. They should not be en route over weekends and State Holidays. Try to ship samples soon after collection. **Remember, samples received 30 hrs after collection will not be tested.** Use first class postage if sending them through the mail, however, you may send them Fedex, UPS or SPHL's courier system. Bacteriological samples may be sent to the SPHL or the Southeast District Lab in Poplar Bluff.

Explanation of results

If the test for coliform and e-coli are **absent**, then the water is considered SATISFACTORY for drinking. If the test is **present** for coliform and/or e-coli, the water is considered UNSATISFACTORY for drinking. The presence of either or both bacteria would indicate that contamination has occurred in the well.

Discontinue use of the water for drinking and food preparation until the well has been disinfected and two consecutive samples are determined to be SATISFACTORY (see subsection 6.7 Disinfection of wells).

If your report says UNSATISFACTORY FOR TESTING, then one or more of the following situations may have occurred:

- Sample collected in an improper container
- Sample received more than 30hrs after collection
- Detectable chlorine present
- Insufficient sample quantity
- Overfilled sample bottle
- Inaccurate or incomplete information on form
- Sample collected from a source other than a drinking water supply

The above guidelines for filling out the LAB 10G form, collecting and shipping the sample should be followed to ensure that the sample will be accepted for testing.